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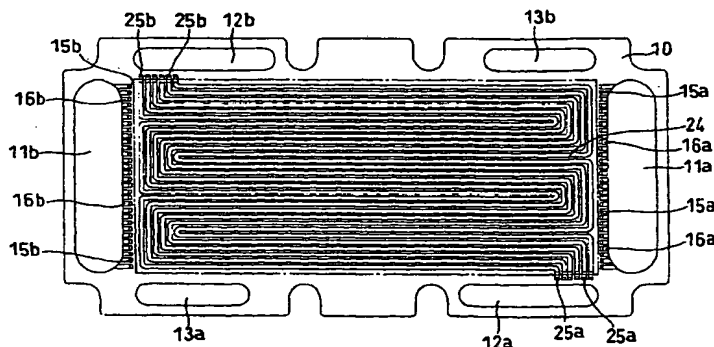
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(54) **Polymer electrolyte fuel cell stack**

(57) Disclosed is a polymer electrolyte fuel cell including improved separators that cause no mixing of a fuel gas and an oxidant gas. The polymer electrolyte fuel cell comprises a plurality of membrane electrode assemblies and a plurality of conductive separators, wherein the plurality of conductive separators comprise at least one separator (10) comprising: a fuel gas inlet-side manifold aperture (12a); a fuel gas outlet-side manifold aperture (12b); a gas flow channel (24) for fuel gas

formed on an anode-side of the separator; an inlet-side through hole (25a) and an outlet-side through hole (25b) penetrating the separator which are formed at an inlet-side end and an outlet-side end of the gas flow channel for fuel gas; and an inlet-side connection groove and an outlet-side connection groove for connecting the inlet-side and outlet-side through holes with the fuel gas inlet-side manifold aperture and the fuel gas outlet-side manifold aperture, respectively, which are formed on a cathode-side of the separator.

FIG. 3





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## EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 017 648 A (JONES DANIEL O) 25 January 2000 (2000-01-25) * column 3, line 3 - column 4, line 59 * * figures 2,2A,3,3A *	1-11	H01M8/02 H01M8/24
X	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 12, 26 December 1996 (1996-12-26) -& JP 08 222237 A (AISIN AW CO LTD;AQUEOUS RES:KK), 30 August 1996 (1996-08-30) * abstract; figures 6,7 *	1-11	
A	US 5 858 567 A (MUEGGENBERG H HARRY ET AL) 12 January 1999 (1999-01-12) * column 10, line 44 - column 11, line 6 *	1-11	
A	US 5 750 281 A (WASHINGTON KIRK B ET AL) 12 May 1998 (1998-05-12) * column 10, line 1 - line 11; figure 19 *	1-11	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H01M
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>8 March 2004</b>	Examiner <b>Standaert, F</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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08-03-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6017648	A	25-01-2000	AU 6682098 A	11-11-1998
			WO 9847197 A1	22-10-1998
JP 08222237	A	30-08-1996	NONE	
US 5858567	A	12-01-1999	AU 4193996 A	06-05-1996
			CA 2202380 A1	25-04-1996
			EP 0783770 A1	16-07-1997
			JP 10507573 T	21-07-1998
			RU 2174728 C2	10-10-2001
			WO 9612316 A1	25-04-1996
			US 5863671 A	26-01-1999
			US 5683828 A	04-11-1997
			US 6051331 A	18-04-2000
US 5750281	A	12-05-1998	US 5514487 A	07-05-1996
			AU 691387 B2	14-05-1998
			AU 4294796 A	19-07-1996
			CA 2208644 A1	04-07-1996
			WO 9620510 A1	04-07-1996
			DE 69511585 A1	23-09-1999
			DE 69511585 T2	13-01-2000
			EP 0807323 A1	19-11-1997
			JP 3050408 B2	12-06-2000
			JP 10509841 T	22-09-1998

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